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A Survey Of Drug U Sa G E Among Th E Elderly

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By

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Abstract

This was a descriptive study designed to determine if there was a correlation between age and the complexity of drug regimens and to see if the elderly were at a greater risk for disruption of health due to medications than the middle-aged group. The researcher hypothesized that there would be no significant difference between age and the complexity of the drug regimens, and that there would be no significant difference between middle-aged and elderly adults' level of risk for development of disruption of physical health due to drug regimens.

A researcher-designed tool was administered to 27 middle-aged adults between the ages of 30 to 59, and to 36 elderly adults between the ages of 60 to 90. There was a total of 63 participants. The total consisted of 3 black males, 17 white males, 11 black females, and 32 white females.

The first null hypothesis was tested by correlating age with the complexity of drug regimens. The Pearson's R correlation coefficient was used to analyze the data collected. Because the obtained r value was .1559 and not significant at the .05 level, the researcher failed to reject the null hypothesis.

The second null hypothesis was tested by comparing the scores for disruption of physical health of middle-aged and elderly adults. The *t*-test was utilized for comparing the mean scores at the .05 level of significance. The obtained *t*-value was -3.71. Since this value was significant at the .01 level, the researcher rejected the null hypothesis.

CHAPTER I

The Research Problem

Today the aged comprise approximately eleven percent of the population (Caldwell & Hegner, 1981; Kart, Metress, & Metress, 1978; Lundin, 1983). They will constitute seventeen to twenty percent of the population fifty years from now (Hanan, 1978; Lundin, 1983). The human life span has lengthened from 22 to 70 years and more (Caldwell & Hegner, 1981). Persons 85 years and older constitute the fastest growing segment of the United States population and are increasing by forty percent annually (Lamy & Krug, 1983). It has been estimated their number will double within the next 20 years (Lamy & Krug, 1983).

Health professionals have expressed a growing concern regarding the amount of drug usage among the elderly population. Utilization studies have revealed that more drugs are prescribed for the geriatric segment of society than for younger age groups (Fitzgerald, 1980). The elderly account for about twenty-three percent of total drug consumption (Krupka & Vener, 1979; Mayersohn, 1982). This figure is disproportionate to the percentage of the population they represent and accounts for a greater percentage of total health care expenditures (Mayersohn, 1982). Medical treatment of the elderly accounts for about thirty percent of the nation's health care expenditures (Lundin, 1983). By the end of this

century, fifty percent of medical costs will be consumed by the elderly (Walker, 1983).

Due to the aging process and to interference from disease, the elderly person's physiologic responses to drugs change with the normal alteration of the body systems (Block, 1983; Ebersole & Hess, 1981). These changes, such as leaner body mass, decreased parenchymal tissue, and increased number of fat deposits, are responsible for the differences in the ability to handle standard dosages of drugs (Ebersole & Hess, 1981). Cerebral blood flow is reduced in the normal elderly client and markedly diminished in the arteriosclerotic client. Drug therapy involving central nervous system depressants may result in oversedation, loss of coordination, or confusion (Block, 1983).

The geriatric client's cardiac output is decreased. The heart is less capable of responding to stress and the elderly client is predisposed to developing cardiac dysrhythmia and heart failure. In addition, many of the cardiovascular drugs have a narrow therapeutic range (Block, 1983). The thiazides are the most widely used diuretics. Because of a decrease in the number of functioning nephrons and the decline in the rate and extent of renal blood flow in the elderly, renal function is compromised to some extent (Block, 1983).

Chronic conditions represent the major health problem of middle-aged and older adults today (Kart, Metress, & Metress, 1978). Eighty percent of the elderly have one or more chronic conditions (Brock, 1980;

Lundin, 1983; Solomon & Weiner, 1983).

Elderly persons may be suffering from multiple physical conditions superimposed upon each other rather than from a single disease (Kart, et al., 1978). Vulnerability to medication use and misuse in the search for better health is created by chronic illness. Those elderly persons who have multiple pathologic conditions experience extensive drug use and are therefore at risk for adverse drug reactions and interactions (Ebersole & Hess, 1981). Often elderly people take four to five drugs per day, and in some instances as many as ten to thirteen per day have been reported (Lamy, 1974). Unfortunately, many elderly people consume large quantities of prescription drugs with little knowledge of the dangers possible when combined with nonprescription drugs (Shomaker, 1980).

Overuse of over-the-counter (OTC) drugs by the elderly is not uncommon (Ebersole & Hess, 1981). Decreased income and mobility renders the elderly more readily susceptible to nonprescription drug advertisements (Shomaker, 1980). According to the World Health Organization, people average 1.4 different nonprescription drugs a day for illness or prevention of illness (Shomaker, 1980).

The incidence of drug reactions and interactions rises according to the number of drugs taken, and one drug may decrease or increase the effect of another or may cause a completely different effect than is desired (Wolanin, 1981). Age-related alteration in the absorption, distribution, metabolism, and excretion of drugs increases the risk of

drug-induced disease and mortality (Ebersole & Hess, 1981; Fitzgerald, 1980). A realistic evaluation of any person's tolerance to a drug is accomplished by weighing these four factors: the person's physiological state; past and present pathology; nutritional state; and past and present drug regimens (Durgin, 1982).

The researcher became interested in studying geriatric drug usage after working in a geriatric long-term care facility and observing the medication regimens of the patients. There seemed to be a particular pattern of medication therapy among geriatric patients. The researcher then began to wonder if these medication regimens were typical of all persons or just particular to this institution.

Because of the constantly increasing elderly population and the current emphasis on treatment of chronic rather than acute conditions, the administration of medications and monitoring their effects has become a major concern of health care practitioners today (Pagliaro & Pagliaro, 1983). Physiologic changes that occur with increasing age and the increased side effects or toxicity of many drugs in the geriatric client require special attention for drug therapy in the aged (Ritschel, 1983). "The susceptibility of the elderly to drug-induced illness or adverse reactions is underscored by age-related differences in health and drug use patterns" (Block, 1983, p. 140).

Nurses and nurse practitioners/clinicians deliver the bulk of professional geriatric care in many institutional and community settings.

Therefore, nurses' availability to and ongoing observation of elderly patients puts them in a prime position to supervise and regulate drug regimens (Baker, 1981). Also, the elderly population will constitute a large portion of the Family Nurse Clinician's (FNC) practice. Therefore, he/she must be knowledgeable of the possible side effects, adverse reactions, correct dosages, and potential drug-drug interactions of geriatric medication regimens. With this knowledge, the FNC will be able to provide the optimum pharmacologic management of his/her geriatric clientele.

The purpose of this study was to determine the numbers and kinds of drugs used for the elderly and describe the potential for clinically significant drug-drug interactions and any other significant problems such as dosage and appropriateness of the drug for the elderly. Thus, the major questions to be answered by this study include: (1) Does the number of drugs increase in direct proportion to age of the client? and (2) Is the elderly population at risk due to medication regimens?

CHAPTER II

Theoretical Basis of the Study

Johnson's (1980) Behavioral System Model for Nursing was utilized as the theoretical basis for this study. Johnson (1980) views man as a behavioral system comprised of seven subsystems that are interrelated and interdependent. These subsystems are: attachment or affiliative, dependency, ingestive, eliminative, sexual, aggressive, and achievement (Chinn & Jacobs, 1983). The subsystems strive to maintain balance and stability of the behavioral system (Chinn & Jacobs, 1983).

Johnson (1980) believes that similar patterns occur in both health and illness. Survival, reproduction, and growth of the human organism are the goals of the system. In order to maintain the stability of the system and meet its goal, each subsystem must receive adequate functional requirements (Roy, 1976). For the elderly, this frequently necessitates consuming a variety of medications in order to manage chronic health conditions.

The goal of nursing is to bring about behavioral stability. Regularities in behavior must be established so that the goal of each subsystem will be fulfilled. Nursing functions are geared to establish these regularities. Behavioral stability will exist when a minimum

expenditure of energy is required, continued biological and social survival are insured, and some degree of personal satisfaction is added. Instability may occur as either physiological or behavioral changes (Roy, 1976). The FNC is responsible for supervision of medication regimens utilized to bring about physiological stability in the elderly client.

Johnson's (1980) Behavioral System Model for Nursing allows the FNC to view the elderly person as a whole system. Inappropriate drug therapy will cause instability within the behavioral system and thus prevent the subsystem or subsystems affected from functioning at an optimum level. Knowledge of appropriate geriatric drug dosages, adverse reactions, side effects, and potential drug-drug interactions will allow the FNC to anticipate possible problems with medication regimens and prevent unnecessary hazards. According to Johnson (1980), the goal of nursing is to "preserve the organization and integration of the patient's behavior at an optimal level under those conditions in which the behavior constitutes a threat to physical or social health, or in which illness is found" (Johnson, 1980, p. 214). Therefore, the FNC must provide optimum pharmacologic management for his/her geriatric clientele in order to maintain an optimal level of physiological functioning. The purpose of this study is to provide the data necessary for the FNC to maintain optimum pharmacologic management of his/her geriatric clientele.

CHAPTER III

Hypotheses

Theoretical Hypotheses

I. When a group of elderly people are surveyed utilizing a researcher-designed medication history questionnaire, there will be no significant correlation between age and the complexity of the drug regimens.

II. When a group of elderly people are surveyed utilizing a researcher-designed medication history questionnaire and the results are compared to a survey of middle-aged adults, there will be no significant difference in the two groups' level of risk for development of disruption of physical health due to drug regimens.

Theoretical Definitions

a group of elderly people--black and white men and women aged 60 to 90 years who use the services of the health clinic in Gordo, Alabama during the period of data collection.

surveyed--responding to a researcher-designed medication history questionnaire.

researcher-designed medication history questionnaire--a questionnaire designed by the researcher that lists age, sex, race, prescription medications, and OTC medications and includes strength, dosage, and

length of time taken of each medication of the respondent.

significant correlation--a statistically relevant relationship based on the Pearson's R at the .05 level of significance.

complexity--increased number of medications.

drug regimens--medications taken on a daily basis.

compared--using the t-test.

middle-aged adults--black and white men and women aged 30 to 59 years old.

level of risk--chance for occurring.

disruption of physical health--development of pathologic conditions in the body.

significant difference--at the .05 level of significance.

Operational Hypotheses

I. When the results of a researcher-designed medication history questionnaire administered to black and white men and women aged 60 to 90 years old are analyzed and correlated to age using the Pearson's R at the .05 level of significance, there will be no significant correlation between age and the increased number of medications taken on a daily basis.

II. When a researcher-designed medication history questionnaire is administered to black and white men and women aged 30 to 59 and 60 to 90 and the results of the two are compared using the t-test at the .05 level of significance, there will be no difference in the two groups in

terms of the tendency to develop pathologic conditions as a result of the drugs they are taking.

CHAPTER IV

Review of the Literature

Introduction

There are several areas this researcher believes to be pertinent to a study of geriatric drug usage. This belief led the researcher to structure this review of literature in the following manner: an overview of physiological changes in the elderly that affect drug usage, identification of the most common health conditions of the elderly, and finally, studies regarding the complexity of geriatric drug regimens.

Physiological Changes

Drug absorption is defined as "the time required for a medication introduced into the body by oral, parenteral, or rectal route to enter the general circulation" (Ebersole & Hess, 1981, p. 178). The small intestine is the organ in which maximum absorption occurs when medications are given orally. Drugs given parenterally enter the circulatory system either immediately via intravenous administration or at a steady rate via intramuscular injection. The rate at which oral drug absorption occurs is dependent upon the time required for the stomach to empty (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

There does not seem to be conclusive evidence of an appreciable change in the oral absorption process in the elderly. However, one factor

that might influence absorption is changes in gastric motility and the time it takes the drug to enter the small intestine. Impaired or slowed mesenteric blood flow also interferes with absorption. Sluggish blood flow lengthens the time of absorption and causes an increase in the amount of drug absorbed (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

Bender (1965) conducted a study on the effect of increasing age on the distribution of peripheral blood flow. Absorption from the gastrointestinal (GI) tract was found to be impaired as a result of atrophy of the absorbing intestinal epithelium, a delay in gastric emptying, or a decrease in GI tract motility. Webster and Leeming (1974) conducted a study of small bowel function in the elderly and found that absorption was impaired in some agents absorbed by active transport.

Drug distribution is dependent upon the adequacy of the circulatory system. The greatest amount of cardiac output and drug concentrations go to the heart, brain, kidneys, and liver. Lesser amounts are directed toward the muscles, bone, and fat (Rodman & Smith, 1979). Sluggish circulation and altered cardiac output cause a delay in the arrival of medication at the target receptors, retard the release of a drug from storage tissue, and stall the excretion of the drug or its by-products from the body (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

Distribution also influences the amount of free and bound drug in

the circulatory system and is dependent upon the availability of plasma protein. The amount of plasma albumin available for binding with drugs diminishes in the elderly. Therefore, more free active drug circulates in the elderly person's blood and becomes a contributing factor for drug overdose and toxicity (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

Cardiac output decreases approximately one percent per year with age (Bender, 1965). Regional blood flow decreases at different rates and renal blood flow is the most prominent decrease (Goldman, 1971).

When Novak (1972) conducted a study of females aged 18 to 85 regarding changes in body composition, the results were that although body weight may remain constant throughout adulthood, body composition changes with increasing age resulting in less lean body mass and more fat tissue. Total body fluid was also found to decrease significantly with age.

Wallace, Whiting, and Runcie (1976) conducted a study on multiple drug therapy in the elderly. Highly bound acidic drugs such as phenylbutazone, salicylate, and sulfadiazine were displaced from their binding sites by other drugs and resulted in higher free drug levels.

The liver is the primary site of drug metabolism. Decreased blood flow to the liver as a result of disease or the normal aging process causes decreased hepatic drug clearance. The metabolic rate determines the duration of drug action. Consequently, slow metabolism will cause

a drug to remain in the body longer (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

When Calloway and Merrill (1965) conducted a study of sulfobromophthalein and bilirubin clearances, no age-related differences were found. Levy (1977) concluded from a study of age and its effect on the disposition and pharmacologic activity of drugs that the activity of drug biotransformation pathways is higher in the elderly.

Most drugs are excreted in the urine. However, some drugs are eliminated by the liver via bile. The decreased efficiency of the liver and kidneys make it more difficult for the elderly person's body to metabolize and excrete drugs (Caldwell & Hegner, 1981; Cheung, 1979; Hayter, 1981). Many drugs are lipid soluble and require metabolic action to increase their water solubility in order for the kidneys to excrete them. Renal changes and renal disease brought about as a result of age, dehydration, and congestive heart failure slow drug excretion and therefore potentiate drug accumulation and toxicity. The biologic half-life of a drug is the time required for excretion of one half of the drug and is affected by the amount of kidney function. Altered filtration and diminished plasma volume are a common occurrence in the elderly. These two occurrences prolong and elevate blood levels of drugs. (Cheung, 1979; Ebersole & Hess, 1981; Hayter, 1981).

The fact that elderly persons have reduced renal function even without the presence of kidney disease was documented by Heider and

Brest (1965). This was further supported by the research of Ritschel (1977) that concluded that elderly persons have reduced renal function causing an increase in biologic half-life of drugs eliminated via the kidneys.

Multiple Health Problems

While it has been established that various physiological changes occur in the elderly, they are also faced with multiple health problems. These multiple health problems necessitate a greater use of drugs.

As early as 1968, the Task Force on Prescription Drugs reported that the most common conditions for which drugs were prescribed were heart disease, hypertension, arthritis and rheumatism, and mental and nervous conditions. This is still true according to Lofholm (1978) who reported that the most frequent occurring conditions for which drugs are prescribed for the elderly are as follows: (1) heart conditions; (2) hypertension; (3) arthritis; (4) mental and nervous conditions; (5) gastrointestinal diseases; (6) genitourinary diseases; (7) diabetes; (8) cough, sore throat, and flu; (9) circulatory problems; and (10) chronic skin conditions.

That the elderly have more factors pre-disposing them to disease has been supported by many authors. Hrachovec (1969) reported a gradual age decline in the functional and reserve capacities of individuals, thus increasing the likelihood of disease. Four aspects of aging that influence vulnerability to infection are: (1) degenerative changes and diseases associated with old age; (2) age-associated circulatory

dysfunction; (3) poor nutritional reserves; and (4) age-associated changes in the immune system itself (Pesanti, 1977). The role that nutritional deficiencies play in the vulnerability of the elderly to infection is further supported by Krehl's (1974) work.

Geriatric Drug Regimens

As stated earlier, elderly persons consume large quantities of drugs in order to manage chronic health problems. When reviewing the literature, the researcher found that few studies have been done regarding drug usage among the elderly population. A discussion of geriatric drug regimens follows.

Lundin (1976) conducted a study to determine the medication taking behavior of the elderly. Fifty persons aged 65 years of age and older who volunteered for the study were interviewed utilizing a structured interview guide.

Subjects were questioned regarding prescription and nonprescription medications. For the 50 subjects, a total of 170 prescription medications (99 different drugs) were being taken. Numbers ranged from 0 to 8 per person, with a mean of 3.4 per person. For nonprescription drugs, a total of 146 (53 different drugs) were being taken. The range of nonprescription drugs was 0 to 9 per person, with a mean of 2.9 per person.

Concerning prescription drugs, subjects knew the purpose of 89 percent of their medications. Twenty-five percent did not take their medication as labeled. Ten percent admitted to taking medications

intended for another person, but six percent specified having done this only once. Six percent admitted to having someone else help them remember to take their medication, while thirty-eight percent admitted to having specific memory aids themselves.

Concerning nonprescription drugs, 10 percent were taking over-the-counter (OTC) drugs only. Sixty percent took some aspirin containing prescription product and/or OTC medication, while 28 percent took more than one aspirin containing product.

With regard to information concerning medication usage, only 34 percent of the 170 prescription drugs were accompanied by supplementary instructions. Sixty-six percent were accompanied by no instructions other than those on the label.

Green (1978) found that over one third of persons aged 60 and over routinely ingested 5 or more medications per day. This was further supported by Krupka and Vener (1979) who reported that noninstitutionalized elderly persons took an average of 5.6 drugs daily; 2 prescription drugs, 1.8 OTC, and 1.8 social drugs (such as alcohol, nicotine, and caffeine).

Requarth (1979) studied the most common medication combinations taken by the elderly. He discovered these medications to be as follows: (1) tranquilizers, sedatives, and gastrointestinal preparations; (2) diuretics, tranquilizers, and potassium; (3) vitamins, minerals, and gastrointestinal preparations; (4) gastrointestinal preparations, tranquilizers, diuretics, and vitamins; (5) potassium and diuretics;

(6) digitalis preparations and diuretics; and (7) analgesics.

Elderly persons receiving two or more drugs may receive a rather large cumulative dose of central nervous system depressants and the possibility for clinically significant drug interactions is high (Reidenberg, 1981). Further adverse drug reactions were supported by Klein, German, and Levine (1981) who found the elderly predisposed to adverse drug reactions because of the large quantities of drugs they consume. In addition, the effects of aging on distribution, metabolism, and patterns of drug usage also are factors that create a climate for adverse drug reactions.

Ellor and Kurz (1982) conducted a survey to determine the drug-taking behavior of noninstitutionalized older adults. The research study focused on knowledge, attitudes, and behaviors associated with drug-taking activities, and explored drug misuse and abuse by elderly persons.

A 17 item open-ended questionnaire was utilized in a 30-minute interview to collect the data from a random sample of 41 hospital patients. The average age of the subjects was 70.8 years and ranged from 62 to 83. Women comprised 75 percent of the sample, 25 percent were men. Sixty-seven percent of the sample were white and 33 percent were black.

A total of 134 drugs were prescribed for the 41 subjects. The average number was 3.1 drugs per person and ranged from 0 to 8. A total of 35 nonprescription drugs were reported; the mean being 0.814

and ranging from 0 to 3 drugs.

When asked what the subject did to help remember to take medication, 20 reported doing nothing special; 3 reported using a calendar or written sheet; 6 took medications with them; 6 measured out a day's supply; and 6 placed their medications in a specific location. When asked if specific storage was relevant to their remembering to take medications, 21 subjects reported keeping medications on kitchen shelves or tables; 12 subjects kept their drugs in the bedroom; and only 4 used the medicine cabinet in their bathroom.

When asked what they did if they forgot to take medication, 9 subjects denied forgetting; 22 skipped the dose; and 6 made up the missed dose the next time. When asked if a family member or friend was involved in the subject's drug therapy, 12 reported help from a spouse; 9 reported help from children; 3 reported help from a friend; and 1 reported help from another relative. This help consisted of being verbally reminded 10 times, picking medications up from the pharmacy 12 times, and administration of the drugs by someone else 4 times.

Five questions ascertained various facets of drug education. Twenty-six subjects received only the prescription label or no information at all about their medications. Four of the subjects received drug information from nurses. When questioned concerning information for potential side effects, 29 subjects denied receiving this information; 11 stated they had been informed of such information. When questioned

concerning their attitudes toward taking medication, 19 were considered generally positive; 7 were generally negative; and 11 were resigned to their need for medications.

Summary

The various physiological changes occurring in the elderly that affect drug usage have been well documented. However, few studies have been done regarding chronic health conditions and geriatric drug regimens. Further studies are needed to clarify health problems and drug-use patterns of the elderly population.

CHAPTER V

Research Design and Methodology

Research Design

This research was a descriptive survey of drug usage among the elderly population. "The descriptive survey is a process for gaining pertinent and precise information about an existing situation. The survey typically constitutes a means of obtaining precise facts and figures. It attempts to describe a condition or learn the status of something. It is a flexible means of gathering facts and then seeking relationships among those facts to identify patterns of similarities or differences" (Verhonick & Seaman, 1978, p. 34).

This descriptive survey was seeking to determine if there was a significant correlation between age and the complexity of drug regimens of elderly persons. In addition, the study was also trying to determine if there was a significant difference between middle-aged and elderly adults in their level of risk for development of disruption of physical health due to drug regimens. This information was obtained by use of a medication history questionnaire.

Variables

The independent variable in this study is age. The dependent variable is the medication regimen. The controlled variable is the

geographic area. The intervening variables are

1. truthfulness in completing the questionnaire, and

2. the mental and physical state of the respondent at the time of completing the questionnaire.

Setting, Population, and Sample

The subjects in this study use the services of the health clinic located in rural Alabama. The geographical area in this study is rural with the town having a population of about 2100. This area is classified as rural Appalachia for federal funding purposes and incomes vary from lower class to upper middle class. The average educational level of the population is 10.9 years. The elderly comprise approximately 20.5 percent of the population (Smith, 1983). There are two physicians to serve the town.

The projected total sample size was to be 72; 36 male and 36 female. However, due to the limited number of subjects willing to participate in the study and the limited time of the researcher, the total sample was 63; 20 male and 43 female. The subjects were chosen from those clients using the services of the health clinic on the days the survey was taken who met pre-set criteria and agreed to participate in the study. Also, because there was a limited number of middle-aged persons coming into the clinic on the days of the survey, a portion of the sample was taken from employees of a private nursing home.

Data-Gathering Process

First, permission to conduct the survey was obtained from the physician at the health clinic by use of a personal letter from the researcher to the physician (see Appendix A). A cover letter to further explain the research study, a consent form, and a medication history questionnaire also accompanied the personal letter (see Appendices B, C, and D). On the days of the survey the researcher introduced herself to all black and white men and women between the ages of 30 to 90 years who came into the clinic. The researcher also introduced herself to those employees of the nursing home who met these criteria the days the survey was taken. The researcher then explained the purpose of the study to each subject.

Consent to participate in the study was accomplished by having the subject sign a consent form after it had been read and fully explained by the researcher (Appendix C presents the consent form). The medication history questionnaire (Appendix D) was used to collect data about the numbers and kinds of drugs used among the elderly population and was filled out by the researcher for the participant. The data were collected during the month of November.

Procedure

The tool used was a medication history questionnaire developed by the researcher. The questionnaire gives the age, sex, race, and current prescription and/or over-the-counter medications of the

participants in the study. It also lists the dosage, frequency, and length of time the medications have been taken.

In order to obtain statistical analysis, the medication history questionnaire was scored based on a point system. One point was assigned for each medication taken. In addition, five points were assigned to each of those medications prone to have more serious side effects. One point was assigned to each of those medications with less serious side effects. The points were totaled to obtain Score I. The minimum score was zero. There was no maximum score.

In order to determine the subject's potential to develop disruption of physical health, a second score was obtained by assigning 5 points for each pathologic condition caused or worsened by the client's drug regimen. Example of this are inappropriate dosages, drug-drug interactions, or drugs that would have an adverse effect on an already diagnosed disease. The minimum score was zero. There was no maximum score.

Since this tool was developed by the researcher, no standardized reliability or validity has been established. The researcher pre-tested five subjects not used in this study to determine face validity of the questionnaire. For the purposes of this study, the tool was assumed to have face reliability and validity.

Statistical Analysis

Parametric statistics were used to analyze the data collected.

Since the data in Hypothesis I was interval data, Pearson's R correlation coefficient was used to test the hypothesis. Because the number of subjects in one group was less than 30, the t-test was used to test Hypothesis II. The .05 level of significance was used for all statistical tests.

Assumptions

1. Elderly people would participate in this study.

2. Elderly persons have multiple health problems which necessitate taking a variety of medications.

3. The elderly population take prescription and OTC drugs.

4. Often the elderly do not understand their medication regimens.

5. The medication history questionnaire will give an accurate listing of drugs consumed by the elderly.

6. If FNCs are aware of the medication regimens of the elderly population, they will use this information to provide optimum pharmacologic management of their geriatric clientele.

Limitations

1. The rural area may prevent the results of this study from being generalized to urban areas.

2. Conducting the survey in the South may prevent results of the study from being generalized to the North.

3. Medication regimens of persons aged 30 to 90 years may not be generalized to persons younger than 30 years or older than 90.

CHAPTER VI

Analysis of Data

The purpose of this descriptive study was to determine if there was a correlation between age and the complexity of drug regimens and to see if the elderly were at a greater risk for disruption of health due to medications than the middle-aged group. Data were collected from middle-aged and elderly adults who were administered a researcher-designed medication history questionnaire.

A total of 63 subjects was chosen from the general population of people aged 30 to 90 years. Twenty-seven of these subjects were aged 30 to 59 and classified as middle-aged, while 36 were aged 60 to 90 and classified as elderly. There was a total of 20 males and 43 females. The middle-aged group consisted of 1 black male, 8 white males, 4 black females, and 14 white females. The elderly group was comprised of 2 black males, 9 white males, 7 black females, and 18 white females.

Two scores were obtained from the researcher-designed tool. Score I elicited information about the elderly and the complexity of drug regimens. The raw scores ranged from a low of 0 to a high of 24. The mean score was 9. 4722 with a standard deviation of 6.8722.

Score II involved both the elderly and middle-aged adults and looked at the potential for disruption of health due to drug regimens. The

raw scores for the elderly ranged from a low of 0 to a high of 30. The mean score was 9.1667 with a standard deviation of 7.606. The raw scores for the middle-aged ranged from a low of 0 to a high of 15. The mean score was 3.1481 with a standard deviation of 4.194. These data, along with demographic data are found in Table 1.

Hypothesis I

The researcher hypothesized that when a group of elderly people were surveyed, there would be no significant correlation between age and the complexity of the drug regimens. To test this hypothesis, the researcher utilized the Pearson's R correlation coefficient at the .05 level of significant at the .05 level. Therefore, the researcher failed to reject the null hypothesis. The Pearson's R correlation can be found in Table 2.

Table 2

Correlation of Age and Complexity of Drug Regimens Using the Pearson's R

Measure	N	r	P
Complexity of Drug Regimens	36	.1559	.182

Hypothesis II

The researcher hypothesized that when a group of elderly and middle-aged adults were surveyed and the scores compared, there would be no significant difference in the two groups' level of risk for development of disruption of physical health due to drug regimens. To test this hypothesis, the researcher subjected the data to the t-test at

Table 1

Demographic and Raw Score Data for Researcher-Designed Tool

Subject	Age	Sex	Race	Score I	Score II
S1	63	F	W	8	10
S2	64	F	B	16	10
S3	65	F	W	0	0
S4	69	F	W	0	0
S5	71	F	W	8	10
S6	71	F	B	22	30
S7	71	F	W	0	0
S8	72	F	W	8	0
S9	72	F	W	8	10
S10	72	F	W	13	15
S11	73	F	W	8	5
S12	73	F	B	13	10
S13	74	F	W	24	25
S14	77	F	W	14	5
S15	77	F	W	8	10
S16	77	F	B	10	10
S17	77	F	W	8	10
S18	78	F	W	12	20
S19	78	F	B	18	15
S20	78	F	B	6	5
S21	80	F	W	12	10
S22	80	F	W	0	0
S23	81	F	B	12	5
S24	81	F	W	7	10
S25	83	F	W	18	25
S26	60	M	W	8	10
S27	64	M	W	0	0
S28	66	M	W	0	0
S29	72	M	B	2	5
S30	73	M	W	22	15
S31	73	M	W	10	10
S32	74	M	W	20	15
S33	77	M	W	6	5
S34	78	M	B	14	15
S35	80	M	W	0	0
S36	90	M	W	6	5
S37	33	F	W		10
S38	34	F	B		0
S39	35	F	W		0

Table I Continued

Subject	Age	Sex	Race	Score I	Score II
S40	35	F	B		0
S41	41	F	B		5
S42	43	F	W		5
S43	44	F	W		0
S44	44	F	W		0
S45	47	F	W		5
S46	49	F	W		0
S47	49	F	B		5
S48	50	F	W		5
S49	50	F	W		5
S50	50	F	W		0
S51	50	F	W		10
S52	52	F	W		5
S53	55	F	W		0
S54	58	F	W		5
S55	35	M	W		10
S56	46	M	W		15
S57	48	M	W		0
S58	48	M	W		0
S59	48	M	B		0
S60	51	M	W		0
S61	53	M	W		0
S62	54	M	W		0
S63	55	M	W		0

the .05 level of significance. The mean score for the middle-aged group was 3.1481 with a standard deviation of 4.194. The mean score for the elderly was 9.1667 with a standard deviation of 7.606. The obtained t-value was -3.71 which was significant. Therefore, the researcher rejected the null hypothesis. Table 3 presents these data.

Table 3

Comparison of Middle-Aged and Elderly Adults' Health Risk Levels Using the t-Test

Group	N	$\bar{M}$	SD	t
Middle-Aged	27	3.1481	4.194	-3.71*
Elderly	36	9.1667	7.606	

*$p \leq .01$

Additional Findings

The researcher was somewhat surprised at the number of subjects who were unwilling to participate in this study. On one occasion the researcher stayed all day at the clinic and could not get even one participant. The people seemed to be disinterested or hesitant to participate as though they did not want their time imposed upon or were afraid it would interfere with their seeing the doctor.

For those subjects who were willing to participate, the one-to-one interview technique worked much better than having the participants fill out the questionnaire. Two of the elderly persons could not write. Several of the subjects denied taking medications until further questioned by the researcher. Many of the elderly did not consider over-the-counter (OTC) preparations as medications.

Another observation by the researcher was the reaction of the elderly clients to the word "drug." The term "drugs" seemed to denote a negative connotation with them. They did not consider drugs as medications.

Another interesting fact was that some of the participants admitted openly to not taking medications as directed. They took either less or more. Some even stopped taking the medications without the Doctor's approval.

CHAPTER VII

Summary, Conclusions, Implications, and Recommendations

Summary

This was a descriptive study designed to determine if there was a correlation between age and the complexity of drug regimens and to see if the elderly were at a greater risk for disruption of health due to medications than the middle-aged group. The researcher hypothesized that there would be no significant difference between age and the complexity of the drug regimens, and that there would be no significant difference between middle-aged and elderly adults' level of risk for development of disruption of physical health due to drug regimens.

A researcher-designed tool was administered to 27 middle-aged adults between the ages of 30 to 59, and to 36 elderly adults between the ages of 60 to 90. There was a total of 63 participants. This total consisted of 3 black males, 17 white males, 11 black females, and 32 white females.

The first null hypothesis was tested by correlating age with the complexity of drug regimens. The Pearson's R correlation coefficient was used to analyze the data collected. Because the obtained r value was .1559 and not significant at the .05 level, the researcher failed to reject the null hypothesis.

The second null hypothesis was tested by comparing the scores for disruption of physical health of middle-aged and elderly adults. The t-test was utilized for comparing the mean scores at the .05 level of significance. The obtained t-value was -3.71. Since this value was significant at the .01 level, the researcher rejected the null hypothesis.

Conclusions and Implications

Although this study is not directly comparable to other studies, the findings can be related to similar research. This researcher found that the elderly do consume large quantities of medications for multiple health conditions. These medications include prescription and OTC preparations. These data are supportive of previous studies (Ellor & Kurz, 1982; Green, 1978; Krupka & Vener, 1979; Lundin, 1976; Requarth, 1979). The findings from this study support previous research that the elderly are at risk due to medication regimens (Klein, German, & Levine, 1981; Reidenberg, 1981). The data also are consistent with previous research that elderly persons do not always take medications as directed (Ellor & Kurz, 1982; Lundin, 1976).

Because the elderly do consume large quantities of medications, the family nurse clinician (FNC) should incorporate a thorough drug history in assessment of clients. He/She should be knowledgeable of possible side effects, drug-drug interactions, appropriate dosages, and effects of medications on various pathologic conditions since the elderly are at a greater risk for disruption of health due to medication

regimens.

Some of the elderly persons did not consider OTC preparations as medications. The FNC should be aware of this and educate the elderly that whatever is ingested for various ailments should be considered as medication. The FNC should inform the elderly as to possible adverse reactions and interactions of prescription and OTC preparations.

The researcher noted a negative connotation to the word "drugs" by the elderly. They did not think of medications as drugs. The FNC should be aware of this connotation and should choose his/her terminology so that the client will understand what is being said.

Because nurses and especially FNCs need to be more aware of medications and their effects, nursing schools should place strong emphasis on pharmacology courses. This is especially important in regard to the elderly.

Many of the elderly were unwilling to participate in this study. The FNC should be aware of this fact and realize that he/she may really need to stress the reasons for research to the elderly. The elderly must be made to understand the significance of geriatric research. If they do not understand this significance, the FNC may find it difficult to conduct studies with them.

Recommendations

The researcher recommends the following:

Research:

1. Replication of the study utilizing a larger sample.

2. Replication of the study in other geographic areas.

3. Conduction of a longitudinal study to follow individual subjects from age 50-60's to see how health status and medication regimens change.

4. Conduction of a study that looks at medication-taking behavior.

5. Conduction of a study on how the elderly feel toward the term "drugs" rather than "medications."

6. Descriptive research with the elderly be done on a one-to-one interview basis.

Nursing:

1. The FNC should take a careful drug history on all clients.

2. The FNC should be careful of the terminology he/she uses with the elderly.

3. The FNC should recognize that fact that the elderly are at an increased risk for disruption of health.

4. Nursing curricula should strengthen existing courses or add pharmacology courses with particular emphasis on the elderly.

APPENDICES

Appendix A

Personal Letter to Physician

Route 3
Millport, AL 35576
November 8, 1983

Dr. John Brandon
Gordo
AL

Dear Dr. Brandon:

My name is Karen Nabors. I am a registered nurse and currently enrolled in the Graduate School of Nursing at Mississippi University for Women.

I am conducting a study related to drug usage among the elderly population. I would like to ask permission from you at this time to conduct the survey at the clinic during the month of November.

Enclosed you will find a letter explaining the purpose of the study, a consent of participation form to be signed by the participants before taking part in the survey, and a medication history questionnaire which I will fill out with the participant.

The survey can be conducted without imposing upon you or your patients. I would appreciate very much the use of your clinic for collecting the data. I would be able to let you know ahead of time the days I would be conducting the survey and would work with you in determining the most suitable times.

Thank you very much for your consideration. Please sign below to grant permission for use of your clinic in conducting the survey. I

will come by the clinic sometime before November 11 to pick up your reply. Feel free to call me at 662-3574 if you have any questions.

Sincerely yours,

Karen Fields Nabors, R.N.

Enclosures

I do hereby give my consent for use of the health clinic at Gordo, Alabama in conducting the survey on drug usage among the elderly.

Signed_____

Date_____

Appendix B

Cover Letter to Participant

Dear Participant:

My name is Karen Nabors. I am a registered nurse and currently enrolled in the Graduate School of Nursing at Mississippi University for Women.

I am conducting a study on drug usage among the elderly population. The information obtained from you will be useful in providing care for all elderly people, especially those of this area.

To participate in this study you are asked to read and sign the attached consent form. I will then assist you in filling out the medication history questionnaire. It should only take a few minutes of your time.

All the information will be treated as confidential and your identity will remain anonymous. You may withdraw from the study at any time.

Thank you for participating in this study.

Appendix C

Consent of Participation

In consenting to participate in this study of drug usage among the elderly:

I understand that my participation is voluntary;

I understand that my identity will remain anonymous;

I understand that my answers will remain confidential;

I may refuse to answer any question;

I may withdraw from the study at any time;

I understand that this study will be useful in providing care for the elderly population;

I understand that this study has been approved by the Mississippi University for Women's Committee on Human Rights.

Signed_____

Date_____

Appendix D

Medication History Questionnaire

Age_____ Sex_____ Race_____

A. Prescription Medications

Name and Strength of Medicine	Dosage (How many/day)	Frequency (How often/day)	Length of Time Taken
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

B. Over-the-Counter/Home Remedies

	Name and Strength of Medicine	Dosage	Frequency	Length of Time Taken
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

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